

Customer No.: 31561
Application No.: 10/065,632
Docket NO.: 8012-US-PA

REMARKS

Present Status of Patent Application

Claims 15-20 remain pending, of which claim 15 has been amended to more clearly describe the claimed invention. Further, the specification has also been amended to correct some minor typographical errors. It is believed that no new matter adds by way of these amendments made to the claims or specification, or otherwise to the application. For at least for the following reasons, Applicant respectfully submits that claims 15-20 patently define over the prior art of record. Reconsideration is respectfully requested.

Discussion on Claim Rejections:

Response to Claims Rejections under 35 USC§ 102

The Office Action rejected claims 15-17 under 35 U.S.C. 102(b), as being anticipated by Kwon et al. (US-2002/0017711, hereinafter Kwon).

Applicants respectfully disagree and traverse the above rejections as set forth below. Independent claim 15, as amended, is allowable for at least the reason that **Kwon** failed to teach, suggest or disclose every features of the claimed invention. More specifically, Kwon failed to teach, suggest or disclose a process for fabricating a bump comprising at least “performing an electroless plating process for forming at least a bump body on the medium layer, as required by the amended claim 15”. The advantage of using an electroless plating process for forming the bump body is that the shape and the height of the bump body can be precisely controlled by controlling the shape, width and the height of the opening in the photoresist layer. Further, by using the electroless plating process for forming the bump body, the process can be substantially simplified compared to the bumping process, and therefore the manufacturing cost can be substantially reduced.

To the contrary, **Kwon** (please see paragraph [0023]) substantially discloses a process of forming a Under Bump Metal (UBM) 108 using electroplating or electroless plating process but failed to teach a method of forming a metal bump 110 using an electroless plating process. Accordingly, Applicants respectfully submit that **Kwon** cannot meet claim 15 in this regard.

Further, **Kwon** substantially teaches (please refer to paragraphs [0024] through [0027]) a semiconductor wafer 100 on which a metal bump 110 is formed. **Kwon** discloses various processes for forming the metal bumps on the chip pads 104 having UBM 108. According to a first process, the wafer 100 is dipped in a molten solder 114 in a container 112 can form a solder bump 110a. When the wafer 100 is dipped in the molten solder 114 and taken up, the molten solder 114 sticks only to the UBM 108 on the chip pad 104, not to the passivation layer 106. The solder on the pads 104 solidifies, forming the metal bump

110a. According to a second process, metal jetting of molten solder can also form a solder bump 110b, as shown in FIGS. 10 and 11. An injector 116 of a metal jetting apparatus (not shown) drops the molten solder 118 on the chip pad 104. The molten solder 118 solidifies on the chip pad 104, forming the metal bump 110b. According to a third process, a wire-cutting method that forms a metal bump 110c. According to this method, a metal wire 124 is ball-bonded on the chip pad 104 with a wire bonder 120, and a cutting tool 122 cuts the metal wire 124 above the ball-shaped portion of the metal wire 110c, forming the metal bump 110c. In other words, Kwon substantially failed to teach, suggest or disclose an electroless plating process for forming metal bumps as specified by the claim 15 of the claimed invention, instead substantially teaches a dip method (first method), a metal jetting of molten solder method (second method) and a wire cutting method as substantially described above. Accordingly, Applicants respectfully submit that Kwon cannot possibly meet the claimed invention in this regard.

For at least the foregoing reasons, Applicant respectfully submits claims 15-17 patentably define over Kwon, and therefore should be allowed. Reconsideration and withdrawal of these rejections is respectfully requested.

Response to Claims Rejections under 35 USC§ 103

The Office Action rejected claims 18-20 under 35 U.S.C. 103(a), as being unpatentable over Kwon as applied to claims 15-17 above, and in further view of Hwan et al. (US-2002/0180064, hereinafter Hwan).

Applicants respectfully disagree and traverse the above rejections as set forth below. Applicants respectfully submit that claims 18-20 depend from independent claim 15 which is deemed allowable over Kwon for reasons substantially discussed above, in that Kwon substantially lacks a process of performing an electroless plating process for forming the bump body. Even though the Office Action relied upon Hwan to disclose a process of forming a photoresist layer (34) having a window (38), however like Kwon, Hwan also

substantially failed to teach, suggest or disclose a process of performing an electroless plating process for forming the bump body, instead **Hwan** substantially teaches a conventional process of filling the solder metal into the window (38) of the photoresist layer (34) to form the metal solder bump (40). Accordingly, Applicants respectfully submit that **Hwan** disclosure of a process of forming a photoresist layer still cannot cure the specific deficiencies of **Kwon** in this regard. For at least the foregoing reasons, Applicants respectfully submit that no combination of **Kwon** and **Hwan** in a manner suggested by the Office Action can render the claimed invention obvious. Therefore, Applicants respectfully submit that claims 18-20 also patently define over **Kwon** and **Hwan** for the same reasons as substantially discussed above as well. Reconsideration and withdrawal of these rejections is respectfully requested.

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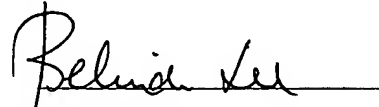
CONCLUSION

For at least the foregoing reasons, it is believed that all pending claims 15-20 are in proper condition for allowance. If the Examiner believes that a conference would be of value in expediting the prosecution of this application, he is cordially invited to telephone the undersigned counsel to arrange for such a conference.

Respectfully submitted

Date :

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